

-- REMARKS --

The present amendment is submitted contemporaneously with the Request for Continued Examination filed in response to the Advisory Action dated October 24, 2006. Claims 1-20 are currently pending in the present application. Claims 13-20 have been withdrawn. Claim 1 has been amended herein. In the Advisory Action, the Examiner maintained the rejection of claims 1-12 on various grounds. The Applicant responds to each ground of rejection as subsequently recited herein and requests reconsideration of the present application.

35 U.S.C. §103 Rejections

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art references when combined must teach or suggest all the claim limitations. See MPEP 2143. To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). See MPEP 2143.03. The Applicant respectfully asserts that the cited references fail to teach or suggest all the claim limitations.

A. Claims 1-3, 6-8, and 12 were rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,603,909 to Varner (the Varner patent) in view of Becker, et al. (the Becker publication) [Erbium Doped Fiber Amplifiers and Technology, 1999].

The Applicant respectfully asserts that the Varner patent and the Becker publication, alone or in combination, fail to teach or suggest all the claim limitations of the rejected claims. The Varner patent fails to disclose, teach, or suggest an optical switch including a loss element having a signal loss; a rare earth doped gain element operable to produce a signal gain in response to an optical pump; and an optical pump source operably connected to the rare earth doped gain element, the optical pump source operable to produce the optical pump in an ON state and no optical pump in an OFF state; in which the signal gain and the signal loss are about

equal, as recited in amended independent claim 1. The *Becker* publication also fails to disclose, teach, or suggest these limitations.

At most, the *Varner* patent discloses a laser pigtail fiber with inherent attenuation characteristic as part of a fiber optic telecommunication system with a pump laser and an optical amplifier. An optical fiber is provided to connect the devices which has an ultraviolet photosensitive core, a low attenuation single mode wavelength region and a very high attenuation, longer wavelength region. *See* Abstract. An input fiber 950 carries an optical signal from a signal source 910 to the amplifier 930. *See* Fig. 9c; column 8, line 66 through column 9, line 66. A source 910, such as a pump laser, pumps the amplifier. *See* Fig. 9c; column 8, lines 12-25.

There is no suggestion in the *Varner* patent that the fiber optic telecommunication system act as an optical switch, that the fiber optic telecommunication system includes an optical pump source operable to produce an optical pump in an ON state and no optical pump in an OFF state to actuate a switch, or that the signal gain and the signal loss are about equal so that the fiber optic telecommunication system can act as a switch. The *Varner* patent lacks an optical pump source operable to produce an optical pump in an ON state and no optical pump in an OFF state, and so fails to suggest all the claim limitations recited in amended independent claim 1. The *Becker* publication also fails to disclose, teach, or suggest these limitations. A switch as defined by *The Columbia Electronic Encyclopedia, Sixth Edition*, Copyright © 2003, Columbia University Press, as an electrical device having two states: on, or closed; and off, or open. There is no suggestion in the *Varner* patent that the fiber optic telecommunication system has a useful on and off configuration.

Claims 2, 3, 6-8, and 12 depend directly or indirectly from amended independent claim 1 and so include all the elements and limitations of amended independent claim 1. As discussed above, the *Varner* patent and the *Becker* publication, alone or in combination, fail to teach or suggest an optical switch including a loss element having a signal loss; a rare earth doped gain element operable to produce a signal gain in response to an optical pump; and an optical pump source operably connected to the rare earth doped gain element, the optical pump source operable to produce the optical pump in an ON state and no optical pump in an OFF state; in

which the signal gain and the signal loss are about equal. Because claims 2, 3, 6-8, and 12 depend from and incorporate the elements of amended independent claim 1, claims 2, 3, 6-8, and 12 are allowable over the *Varner* patent and the *Becker* publication, alone or in combination.

Withdrawal of the rejection of claims 1-3, 6-8, and 12 under 35 U.S.C. §103(a) as being unpatentable over the *Varner* patent in view of the *Becker* publication is respectfully requested.

B. Claims 2-3, 7-8, and 12 were rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,603,909 to Varner (the *Varner* patent) in view of Becker, *et al.* (the *Becker* publication) [Erbium Doped Fiber Amplifiers and Technology, 1999], and further in view of U.S. Patent No. 5,475,528 to LaBorde (the *LaBorde* patent).

The Applicant respectfully asserts that the *Varner* patent, the *Becker* publication, and the *LaBorde* patent, alone or in combination, fail to teach or suggest all the claim limitations of the rejected claims.

Claims 2-3, 7-8, and 12 depend directly or indirectly from amended independent claim 1 and so include all the elements and limitations of amended independent claim 1. As discussed in Section A above, the *Varner* patent and the *Becker* publication, alone or in combination, fail to teach or suggest an optical switch including a loss element having a signal loss; a rare earth doped gain element operable to produce a signal gain in response to an optical pump; and an optical pump source operably connected to the rare earth doped gain element, the optical pump source operable to produce the optical pump in an ON state and no optical pump in an OFF state; in which the signal gain and the signal loss are about equal. The *LaBorde* patent also fails to disclose, teach, or suggest these elements. Because claims 2-3, 7-8, and 12 depend from and incorporate the elements of amended independent claim 1, claims 2-3, 7-8, and 12 are allowable over the *Varner* patent, the *Becker* publication, and the *LaBorde* patent, alone or in combination.

Regarding claims 2 and 7, the Examiner noted in the Advisory Action that the lifetimes of the excited states were not claimed. The Applicants discussion of lifetimes was intended to point out that the *LaBorde* patent does not suggest the core being doped with at least one species of rare earth ion in the range of 5 to 75 wt% as recited in claims 2 and 7, not to address the lifetimes in particular. As seen in FIG. 1, the lifetime declines rapidly with increasing weight %

erbium oxide, indicating that the amplifier glass of the *LaBorde* patent is much less effective with increasing weight % erbium oxide. The *LaBorde* patent confirms this by stating that it is apparent that lifetimes above 8 milliseconds can be obtained with an erbium loading of up to about 3 %, and that quenching occurs above 3 %. *See* column 5, lines 35-42. The Applicants respectfully assert that the *LaBorde* patent fails to suggest the core being doped with at least one species of rare earth ion in the range of 5 to 75 wt% as recited in claims 2 and 7, because the *LaBorde* patent concludes glasses doped with amounts of erbium greater than about 3 weight % tend to quench, that is undergo a condition which greatly reduces the excited-state lifetime.

Withdrawal of the rejection of claims 2-3, 7-8, and 12 under 35 U.S.C. §103(a) as being unpatentable over the *Varner* patent in view of the *Becker* publication and further in view of the *LaBorde* patent is respectfully requested.

C. Claims 4 and 9-10 were rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,603,909 to Varner (the *Varner* patent) in view of Becker, et al. (the *Becker* publication) [Erbium Doped Fiber Amplifiers and Technology, 1999], and further in view of U.S. Patent No. 6,430,349 to Hayden (the *Hayden* patent).

The Applicant respectfully asserts that the *Varner* patent, the *Becker* publication, and the *Hayden* patent, alone or in combination, fail to teach or suggest all the claim limitations of the rejected claims.

Claims 4 and 9-10 depend directly or indirectly from amended independent claim 1 and so include all the elements and limitations of amended independent claim 1. As discussed in Section A above, the *Varner* patent and the *Becker* publication, alone or in combination, fail to teach or suggest an optical switch including a loss element having a signal loss; a rare earth doped gain element operable to produce a signal gain in response to an optical pump; and an optical pump source operably connected to the rare earth doped gain element, the optical pump source operable to produce the optical pump in an ON state and no optical pump in an OFF state; in which the signal gain and the signal loss are about equal. The *Hayden* patent also fails to disclose, teach, or suggest these elements. Because claims 4 and 9-10 depend from and incorporates the elements of amended independent claim 1, claim claims 4 and 9-10 are

allowable over the *Varner* patent, the *Becker* publication, and the *Hayden* patent, alone or in combination.

Withdrawal of the rejection of claims 4 and 9-10 under 35 U.S.C. §103(a) as being unpatentable over the *Varner* patent in view of the *Becker* publication and further in view of the *Hayden* patent is respectfully requested.

D. Claims 5 and 11 were rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,603,909 to Varner (the *Varner* patent) in view of Becker, *et al.* (the *Becker* publication) [Erbium Doped Fiber Amplifiers and Technology, 1999], and further in view of U.S. Patent Publication No. 2002/0030881 to Nilsson (the *Nilsson* application).

The Applicant respectfully asserts that the *Varner* patent, the *Becker* publication, and the *Nilsson* application, alone or in combination, fail to teach or suggest all the claim limitations of the rejected claims.

Claims 5 and 11 depend directly or indirectly from amended independent claim 1 and so include all the elements and limitations of amended independent claim 1. As discussed in Section A above, the *Varner* patent and the *Becker* publication, alone or in combination, fail to teach or suggest an optical switch including a loss element having a signal loss; a rare earth doped gain element operable to produce a signal gain in response to an optical pump; and an optical pump source operably connected to the rare earth doped gain element, the optical pump source operable to produce the optical pump in an ON state and no optical pump in an OFF state; in which the signal gain and the signal loss are about equal. The *Nilsson* application also fails to disclose, teach, or suggest these elements. Because claims 5 and 11 depend from and incorporate the elements of amended independent claim 1, claim claims 5 and 11 are allowable over the *Varner* patent, the *Becker* publication, and the *Nilsson* application, alone or in combination.

Withdrawal of the rejection of claims 5 and 11 under 35 U.S.C. §103(a) as being unpatentable over the *Varner* patent in view of the *Becker* publication and further in view of the *Nilsson* application is respectfully requested.

SUMMARY

Reconsideration of the rejection of claims 1-12 is requested in light of the remarks herein. The Applicant submits that claims 1-12 as set forth fully satisfy the requirements of 35 U.S.C. §§102, 103, and 112. In view of foregoing remarks, favorable consideration and early passage to issue of the present application are respectfully requested.

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Respectfully submitted,

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